

Applicant: Pien et al.
For: MULTIPART SEPARATOR PLATE FOR AN ELECTROCHEMICAL CELL

- 1 1. A multipart separator plate for a fuel cell comprising:
 - 2 a distributor plate for directing fluid flow;
 - 3 a frame surrounding said distributor plate;
 - 4 an impervious separator layer; and
 - 5 a seal layer between said separator layer and said distribution plate.

- 1 2. The multipart separator plate of claim 1 including an internal manifold in
2 said frame, said separator layer and said seal layer for delivering fluid and removing fluid
3 from said distributor plate.

- 1 3. The multipart separator plate of claim 1 in which said distributor plate
2 directs fluid flow to the membrane electrode assembly of the fuel cell.

- 1 4. The multipart separator plate of claim 2 in which said internal manifold
2 delivers and removes fuel gas and oxidant gas to the distributor plate.

- 1 5. The multipart separator plate of claim 2 in which distributor plate directs a
2 coolant fluid flow and said internal manifold delivers to and removes from said distributor
3 plate a coolant fluid.

1 6. The multipart separator plate of claim 1 in which said frame is chemically
2 stable in the presence of the fuel cell fuel gas and oxidant gas.

1 7. The multipart separator plate of claim 1 in which said frame is thermally
2 stable at fuel cell operating temperature.

1 8. The multipart separator plate of claim 1 in which said frame includes a
2 polymer.

1 9. The multipart separator plate of claim 1 in which said frame includes a
2 polycarbonate material.

1 10. The multipart separator plate of claim 1 in which said frame includes a
2 polyvinyl material.

1 11. The multipart separator plate of claim 1 in which said frame includes a
2 recess on its inner periphery for accommodating the periphery of the electrode of the
3 membrane electrode assembly.

1 12. The multipart separator plate of claim 1 in which said frame includes stops
2 for directing the fluid flow in said distributor plate.

1 13. The multipart separator plate of claim 1 in which said seal layer is
2 electrically conductive.

1 14. The multipart separator plate of claim 1 in which said seal layer is
2 thermally and chemically stable.

1 15. The multipart separator plate of claim 1 in which said seal layer includes a
2 sheet of flexible graphite.

1 16. The multipart separator plate of claim 15 in which said seal layer includes
2 Union Carbide Grafoil®.

1 17. The multipart separator plate of claim 1 in which said fuel gas includes
2 hydrogen.

1 18. The multipart separator plate of claim 1 in which said fuel gas includes
2 methanol and reformatre.

1 19. The multipart separator plate of claim 1 in which said separator layer
2 includes a metal.

1 20. The multipart separator plate of claim 1 in which said separator layer
2 includes stainless steel.

1 21. The multipart separator plate of claim 1 in which said distributor plate
2 includes porous graphite.

1 22. A multipart separator plate for a fuel cell comprising:
2 a distributor plate for presenting a fuel gas to the membrane
3 electrode assembly of a fuel cell;
4 a frame surrounding said distributor plate;
5 an impervious separator layer; and
6 a seal layer between said separator layer and said distributor plate.

1 23. The multipart separator plate of claim 22 including an internal manifold in
2 said frame, said separator layer and said seal layer for delivering fluid and removing fluid
3 from said distributor plate.

1 24. The multipart separator plate of claim 22 in which said frame is chemically
2 stable in the presence of the fuel cell fuel gas and oxidant gas.

1 25. The multipart separator plate of claim 22 in which said frame is thermally
2 stable at fuel cell operating temperatures.

1 26. The multipart separator plate of claim 22 in which said frame includes a
2 polymer.

1 27. The multipart separator plate of claim 22 in which said frame is a
2 polycarbonate material.

1 28. The multipart separator plate of claim 22 in which said frame is a polyvinyl
2 material.

1 29. The multipart separator plate of claim 22 in which said frame includes a
2 recess on its inner periphery for accommodating the periphery of the electrode of the
3 membrane electrode assembly.

1 30. The multipart separator plate of claim 22 in which said frame includes stops
2 for directing the fluid flow in said distributor plate.

1 31. The multipart separator plate of claim 22 in which said seal layer is
2 electrically conductive.

1 32. The multipart separator plate of claim 22 in which said seal layer is
2 thermally and chemically stable.

1 33. The multipart separator plate of claim 22 in which said seal layer includes a
2 sheet of flexible graphite.

1 34. The multipart separator plate of claim 22 in which said seal layer includes
2 Union Carbide Grafoil®.

1 35. The multipart separator plate of claim 22 in which said fuel gas includes
2 hydrogen.

1 36. The multipart separator plate of claim 22 in which said fuel gas includes
2 methanol.

1 37. The multipart separator plate of claim 22 in which said separator layer
2 includes a metal.

1 38. The multipart separator plate of claim 22 in which said separator layer
2 includes stainless steel.

1 39. The multipart separator plate of claim 22 in which said distributor plate
2 includes porous graphite.

- 1 40. A multipart separator plate for an electrolyzer comprising:
- 2 a distributor plate for presenting water to the membrane electrode
- 3 assembly of the electrolyzer;
- 4 a frame surrounding said distributor plate;
- 5 an impervious separator layer; and
- 6 a seal layer between said separator layer and said distributor plate.